

## *5<sup>th</sup> ITB International Geothermal Workshop*

*28 – 29<sup>th</sup> March 2016, Bandung*

Pre-workshop course on

Corporate and government decision making for geothermal energy plants

Project Decision Making, Risk Analysis and Environmental Assessment

Teachers: Kees van den Ende, Christian Bos, Ali Ashat, Triarko Nurlambang and Rianne 't Hoen

# Geocap

## Cooperating companies and universities



INAGA



IF Technology



DNV GL



Institute Teknologi Bandung



Delft University of Technology  
Department of Geo-Technology



University of Twente  
Faculty of ITC



Universitas Gadjah Mada



Universitas Indonesia



University of Utrecht  
Faculty of Geosciences –  
Department of Earth Sciences



Netherlands Organisation for  
Applied Scientific Research

### IND coordinator:

INAGA

### NL coordinator:

ITC

### Advisory board:

BAPPENAS (chair)

MEMR

RISTEK DIKTI

Min. Foreign Affairs NL

Rector ITB

Rector UGM

Rector UI

INAGA

Funded by



Ministry of Foreign Affairs of the  
Netherlands





# Workshop Train the Trainers in Utrecht



- Workshop focused on training work packages
- Target group categorization for the training were defined: government, industry, academia and local stakeholder.
- During the lifetime of the project, training materials will only be accessed by training participants or through WP leaders. After the project ends training materials can be publicly accessed with registration.
- Each work package discussed the study guide and training module. Study guidelines are ready at the end of 2015 and early 2016.
- Training activities will begin in 2016

March 26, 2016



# ITB International Geothermal Workshop 2015

IIGCE 2015



March 26, 2016



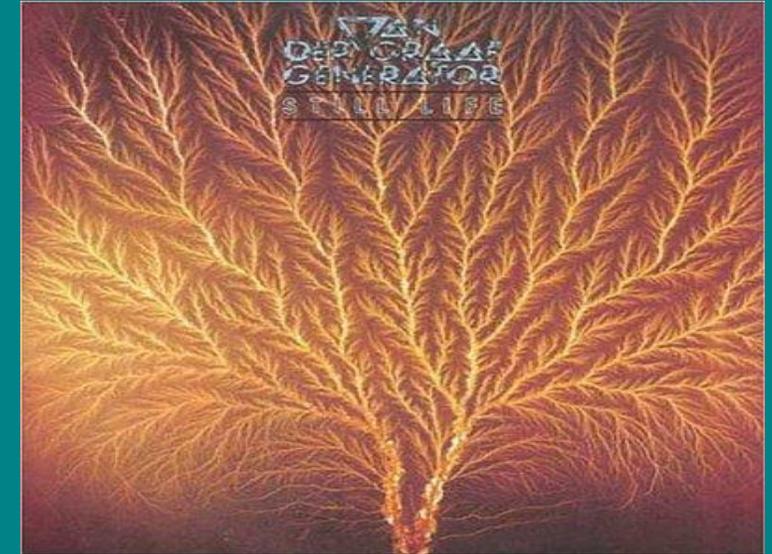
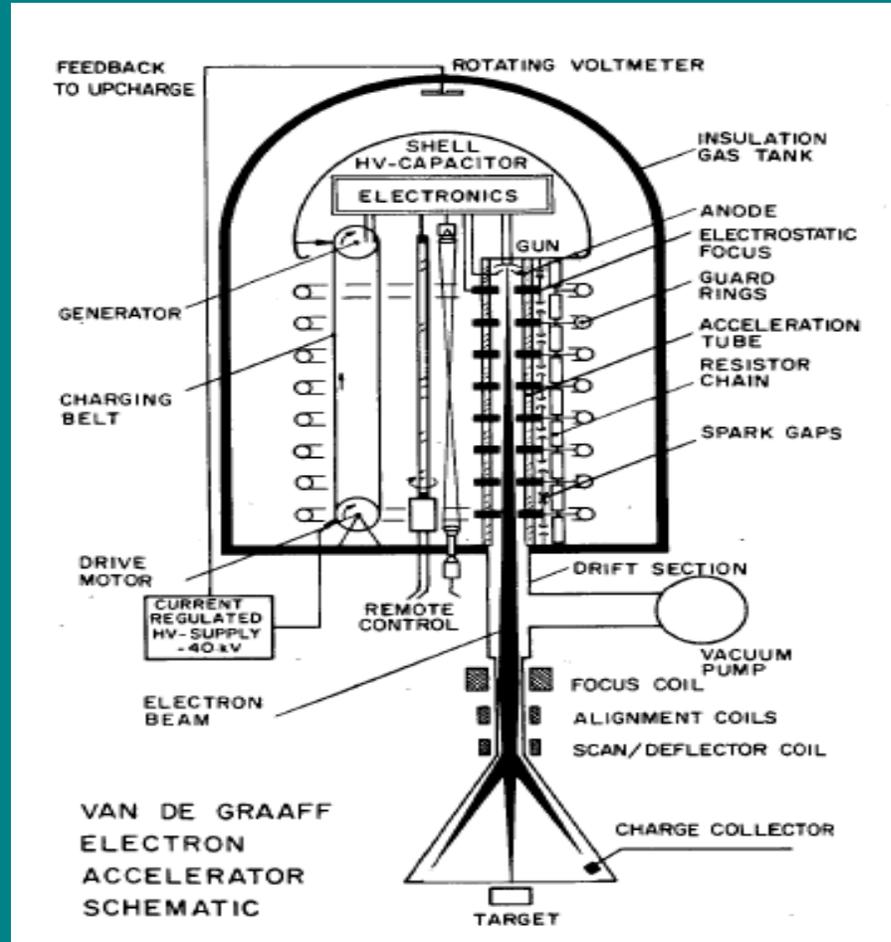
# Kees van den Ende

Physical Chemistry RUL: pulse laser spectroscopy & water activities



From Drs → Dr: 3 MV for Thesis

IRI-Delft



Plus “Polymer materials”

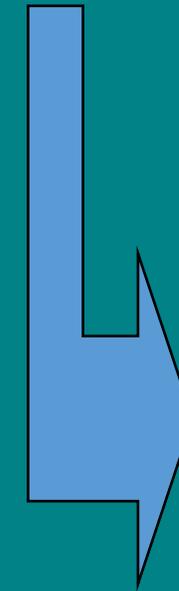
Uni of Twente ('89)

No “Ir” title:

Now only in Bandung!

# From Certification Institute to innovative technical service provider to world leader DNV-GL Energy

Innovation manager of DNV GL  
sms 06 15063363



**DNV-GL Energy**

[Kees.vandenEnde@dnvgl.com](mailto:Kees.vandenEnde@dnvgl.com)

# Rianne 't Hoen – DNV GL



Rianne 't Hoen

Studied Physics (2003 – 2010)

*Utrecht University*

PhD Physics on materials for nuclear fusion (2010 – 2014)

*University of Amsterdam*

Technical professional (2015 – present)

*DNV GL Energy*

Working on the following topics

- Geothermal energy
- Energy storage
- Battery failure analysis
- Market studies

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# Introduce yourself (< 30 sec)

- What is your name?
- What is your background?
  - Study
  - Present position (student/ government/ industry)
  - Relation to geothermal energy
- What do you expect from the course?

# Objectives of the course

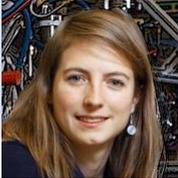
- Provide an introduction to Governmental policy-making (new geothermal law), Governmental licensing decision-making, and Company decision-making.
- Give an overview of environmental assessment issues and how they impact on Governmental decision-making (licensing).
- Introduce processes and evaluation methods to help mature a geothermal project from first concept to Final Investment Decision/ Commercial Operation Date.

*Note, this 2 day course is a pre-cursor for the full courses that will be delivered in August 2016:*

- *Governmental policy-making, and governmental licensing decision-making (3 days)*
- *Company decision-making (5 days)*
- *Environmental aspects of geothermal projects (Oct, 8 days)*

# Programme pre-workshop course

Day 1 :	
08:30 – 10:00	The energy landscape <ul style="list-style-type: none"> <li>- Paris COP21</li> <li>- Renewable energy schemes</li> </ul> 
10:00 – 10:15	Break
10:15 – 11:15	<ul style="list-style-type: none"> <li>- Geothermal energy</li> <li>- Geothermal policy making</li> </ul>
11:15 – 12:15	Outlook Indonesian energy mix <ul style="list-style-type: none"> <li>- Geothermal policy framework</li> <li>- Government take/ tax regime</li> </ul> 
12:15 – 13:00	LUNCH
13:00 – 14:00	Strategic environmental assessment <ul style="list-style-type: none"> <li>- Environmental aspects (flora, fauna, landscape, humans, cultural heritage)</li> </ul> 
14:00 – 15:00	SEA criteria <ul style="list-style-type: none"> <li>- Consideration alternatives</li> <li>- Methods of comparison</li> </ul>
15:00 – 15:30	Break
15:30 – 17:30	Significant effect and mitigation measures

Day 2 :	
08:30 – 10:00	Geothermal plant project phases and decision making <ul style="list-style-type: none"> <li>- Project phases and decision gates</li> <li>- Stakeholders</li> <li>- Decision criteria</li> </ul> 
10:00 – 10:30	Break
10:30 – 12:00	Corporate decision making <ul style="list-style-type: none"> <li>- Decision strategies and evaluation criteria</li> <li>- Methodologies and processes</li> </ul> 
12:00 – 13:00	LUNCH
13:00 – 14:00	Strategies for decision making <ul style="list-style-type: none"> <li>- Decision tree analysis</li> <li>- Multi-criteria analysis</li> </ul>
14:00 – 15:00	Risk analysis methods <ul style="list-style-type: none"> <li>- Sensitivity analysis</li> <li>- Multi-criteria analysis</li> </ul>
15:00 – 15:30	Break
15:30 – 17:00	Risk mitigation <ul style="list-style-type: none"> <li>- Value of information/ value of flexibility</li> <li>- Portfolio management</li> </ul>